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(71) Applicant
Nokia Mobile Phones Limited

(Incorporated In Finland)

P.O. Box 86, SF-24101 Salo, Finland

(72) Inventors
Jukka Solla
Lassi Lahti
Aulis Perttila

(74) Agent and/or Address for Service.

T J Frain
Technophone Limited, Ashwood House,
Pembroke Broadway, Camberley, Surrey, GU15 3SP,
United Kingdom

(54) Mounting clamp for radio unit

(57) A holder for attaching the radio unit of a mobile telephone, comprises a base member (13), a first side member (16) protruding essentially orthogonally from the base member and a second side member (14) protruding essentially orthogonally from the base member, said two side members being aligned essentially parallel and suited to hold the radio unit between them. Furthermore, the first side member (16) of this holder has at least two securing means (17) capable of acting on the radio unit (7), and the second side member (14) of this holder has at least one tightening means (15) that by way of its tightening against the radio unit tensions said second side member thus retaining the radio unit squeezed between the two side members (16, 14).

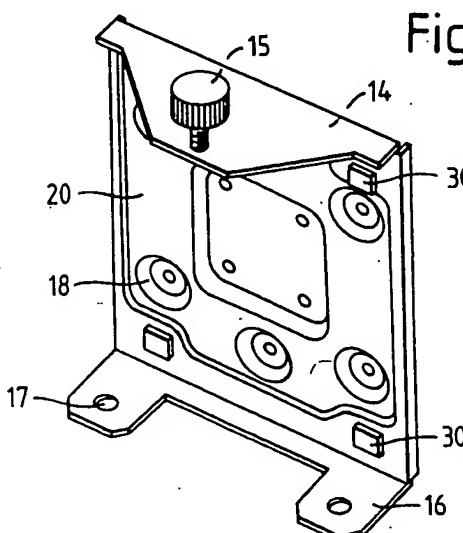
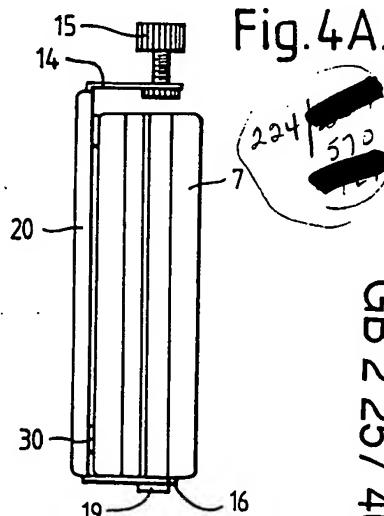


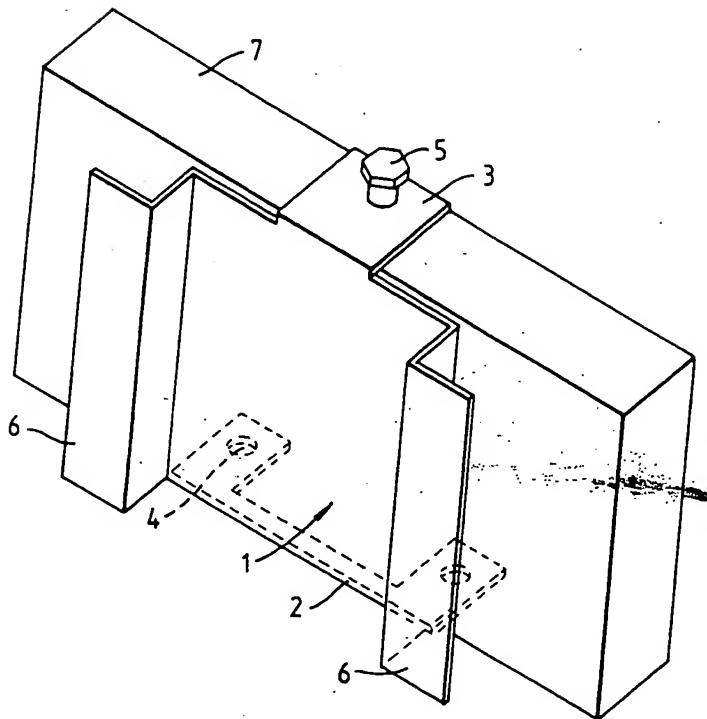
Fig. 3.



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Fig.1.



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Fig. 2A.

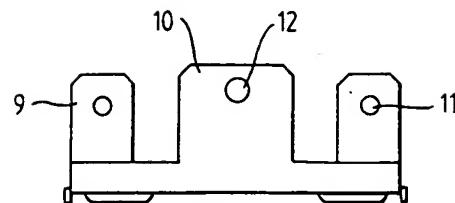
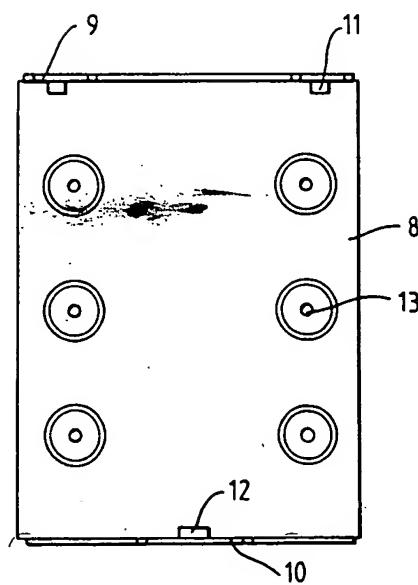


Fig. 2B.



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Fig.3.

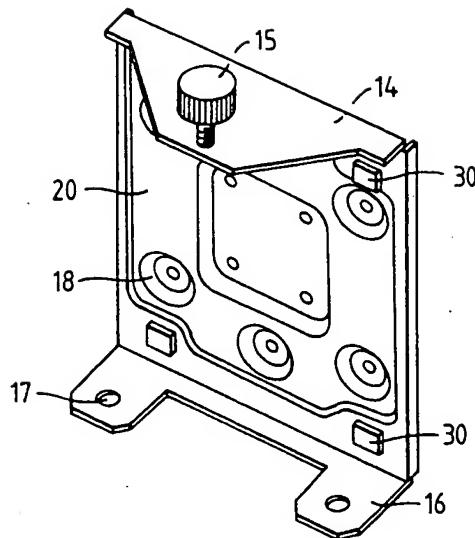


Fig.4A.

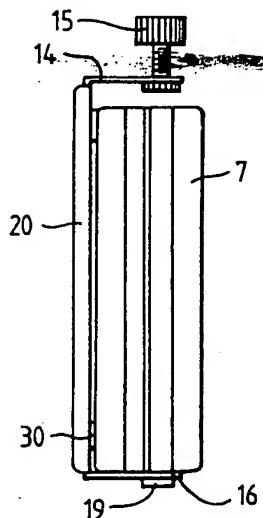
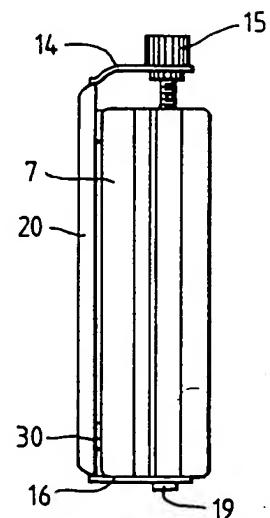
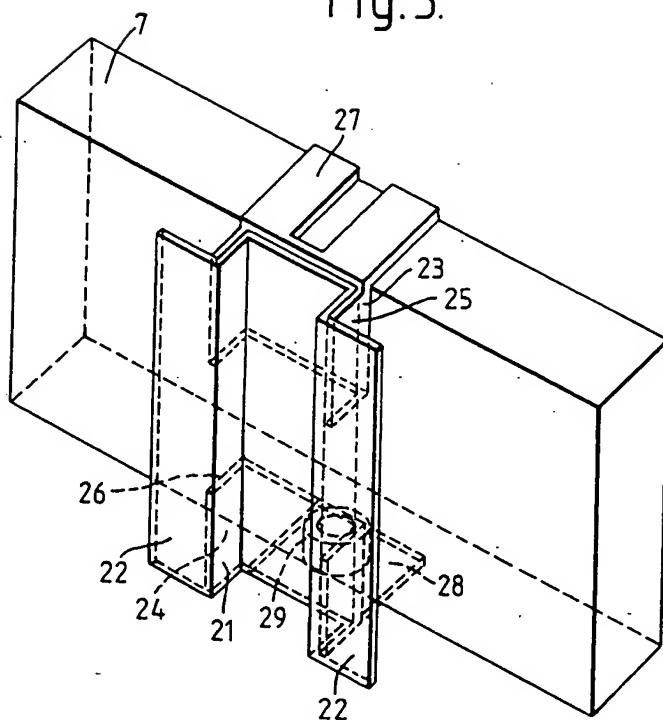


Fig.4B.



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Fig.5.



A Holder

The present invention relates to a holder, particularly a vehicle holder suited for mounting the radio unit of a mobile telephone in a vehicle, said holder comprising a base member, a first side member protruding essentially orthogonally from the base member and a second side member protruding essentially orthogonally from the base member, said two side members being aligned essentially parallel to and spaced from each other so as to hold the radio unit between them.

Known in the art are conventional vehicle holders of the above-described type made of sheet metal in which the radio unit is typically locked with the help of, e.g., different kinds of levers or latches. Latching holders based on tight fits are also frequently used.

Latching of a radio unit of a mobile telephone in a vehicle holder in a reliable manner which is resistant to vibration and different shocks is problematic and in particular in constructions based on tight latching fits. These adaptations are always troublesome in achieving the latching fits, because different fabrication methods require individual production tolerances. Furthermore, wear in use causes the holder to function unreliably, because the fit will not stay tight, and typically the fit is too tight in a new holder, which makes manual insertion into the holder difficult. Vehicle holders made of sheet metal must be produced with relatively high fabrication tolerances to pass vibration and bump tests. Holder constructions based on levers and latches are cumbersome, and therefore, expensive to produce, require a great number of components and are awkward in use. Moreover, such a complicated construction often causes functional disturbance and is thus prone to malfunction.

According to the present invention, the holder is characterized in that the second side member has at least one tightening means operable to tighten against the radio unit such that the second side member is tensioned by forcing the radio unit against the second side member thus retaining the radio unit squeezed between the two side members. This has the advantage that it provides a holder which is easy to use and to which the radio unit of a mobile telephone can be attached in a simple and clearance-free manner so that the radio unit stays tightly in its holder despite imposed vibration and shocks. Additionally, it provides a vehicle holder whose dimensioning does not require extreme precision, thus it does not need to be manufactured to tight fabrication tolerances, thus making the holder cost-effective in production.

The tightening means, which may be a screw is rotatably inserted in the second side member, so that it rotates against the radio unit, such that, the radio unit is pushed by the screw against the first side member. When the radio unit meets the rear-situated second side member, thus being unable to move further backward, the second side member starts to ~~flex~~ away from the radio unit while, the simultaneous stress exerted on the second side member tends to re-straighten the second side member, such that the frictional force between the screw and the second side member retains the screw in position. This has the advantage of preventing its spontaneous loosening under, e.g., vibration, and problems from the wear of the screw and the radio unit during use are avoided, because the elastic locking also overcomes this issue. The tightening system is extremely simple and low-cost to fabricate, since only a bent sheet-metal member and a screw is needed. The use of the locking system is uncomplicated requiring

the rotation of a screw alone. Due to the zero-play locking concept, the radio unit stays firmly in the holder under vibration and shocks.

The spacing between the first and second side members may be adjustable. This has the advantage that one holder can be used for a variety of radio units of different dimensions.

The invention will now be described by way of example only with reference to the attached drawings in which:

Fig. 1 is a perspective view of a holder according to the invention having the radio unit inserted therein,

Fig. 2A is a plan view of a second embodiment of the holder according to the invention;

Fig. 2B is a side view of the same holder that is illustrated in Fig. 2A;

Fig. 3 is a perspective view of a third embodiment of the holder according to the invention;

Fig. 4A is a side view of the holder of Fig. 3 with the radio unit inserted therein;

Fig. 4B is the holder of Fig. 4A with the radio unit secured therein; and

Fig. 5 is a perspective view of a fourth embodiment of the holder according to the invention.

As shown in Fig. 1 a holder according to the invention comprises a U-shaped base 1. The base 1 has two parallel flanges 6 extending perpendicularly from the edges of the opposing limbs of the base 1 for mounting

the holder at a desired location e.g. inside a vehicle. The holder also has a first U-shaped side member 2 and a second rectangular side member 3, both aligned at essentially a 90° angle to the base 1 parallel to each other and orthogonal to the parallel flanges 6. A radio unit 7 for a mobile telephone is shown inserted between the side members 2 and 3. The first side member 2 has two holes 4 and the radio unit 7 correspondingly has two pegs which are located to be inserted in said holes 4 so as to secure the radio unit against the first side member 2. The other side member 3 has a hole, into which a tightening screw 5 is rotatably inserted so as to act on the radio unit 7. When the screw 5 is rotated to rest against the radio unit 7, the radio unit 7 is forced against the first side member 2 and, due to the above-described three-point support, the radio unit 7 is retained firmly in the holder because the position of the radio unit 7 is positively defined which prevents any motion under vibration. The holder is made of sheet metal.

Figs. 2A and 2B show a holder which is relatively similar to the holder illustrated in Fig. 1. The planar base 8 also has two upwardly protruding side members 9 and 10 which are also mutually parallel, of similar shape, and extend substantially orthogonally to the base, and between which the radio unit of the mobile telephone can be inserted. In this embodiment, the first side member 9 has two pegs 11, whereby the radio unit has correspondingly shaped recesses. As in the embodiment illustrated in Figure 1, the second side member 10 has a cylindrical hole 12 into which is rotatably inserted a tightening screw. The base 8 has additional holes 13 for fixing the holder to a desired mounting position with the help of screws.

Figs. 3, 4A and 4B show a sheet-metal holder comprised of a planar base 20, a first U-shaped side member 16 extending substantially at 90° angle from one edge of the base 20 and having two holes 17 therein, arranged to receive respectively two pegs 19 provided on the radio unit 7 and located to be inserted in said holes 17, and a second side member 14 comprising a truncated triangular shaped plate extending substantially orthogonal to the base 20 and having a hole into which a screw 15 acting on the radio unit 7 is rotatably inserted. The side members 14 and 16 are aligned mutually substantially parallel. The holder is mounted at a desired position, e.g., in a vehicle, with screws, whereby the base 20 is provided with holes 18 for the screws. The base 20 may also have spacers 30 provided at each corner to space the radio unit 7 from the base 20.

When the screw 15 is rotated to rest against the radio unit 7, the radio unit is moved by the thrust of the screw against the first side member 16, fabricated of flexible sheet metal, at the rear of the holder. When the radio unit 7 meets this first side member 16 and cannot therefore move any further backward, the second side member 14 begins to flex away from the radio unit 7 by the thrust exerted through the rotation of the screw 15, because the screw at this stage cannot move further forward. This is illustrated in Figure 4B. Simultaneously, the stress imposed on the sheet-metal second side member 14 tends to re-straighten the second side member, while the thrust of the screw maintains the stress in the second side member 14. Then, the frictional force between the screw 15 and the second side member 14 retains the screw locked, thus preventing the spontaneous loosening of the screw due to, e.g., vibration.

The tightness of the locking adjustment can be controlled by modifying the thickness of the second side member 14, the profile of the second side member 14 and upward or downward shifting of the location of the screw 15 in the vertical direction. Also the length and pitch of the screw 15 affect the tightening function of the screw. Use of a coarser pitch of the screw achieves the tightening function with less turns of the screw. The screw 15 need not necessarily be rotated to its end, because the stress between the screw 15 and the second side member 14 is attained already at a small flexion of the second side member 14. If a smaller torque is desired for the rotation of the screw 15, the screw head can be replaced by a lever. Use of a lever also offers a better grasp. The user gets the best feel if the screw 15 has to be rotated to the end. Then, the additional frictional locking between the screw head and the second side member contributes to securing function. A benefit of a knob-like screw head over a control lever is that it needs less space and is less prone to breaking, which is a possibility with a lever.

The elasticity of the second side member 14 compensates for allowances, whereby the holder tolerances are relaxed and thus make the holder combination cost-effective in production.

Figure 5 shows a holder which, as in the holder of Figure 1, comprises a U-shaped base 21 and two-parallel flanges 22 extending perpendicularly from the edges of the opposing limbs of the U-shaped base 21 for mounting the holder at a desired location. The holder further comprises first and second glide members 23,24 which are movable with respect to the base 21 in a direction parallel to the width of the holder. Each glide member 23,24 comprises a U-shaped glide piece 25,26 configured

to slidably fit over the U-shaped base 21 as shown in Figure 1, and first and second side members 27,28 respectively, extending perpendicularly from one edge of the glide piece 25,26. The first side member 27 of the first glide member 23 is U-shaped and the second side member 28 of the second glide member 24 is a rectangular plate having a cylindrical hole 29 in which is rotatably inserted a screw. Both glide members 23,24 are provided with means for example screws, for locking the glide members 23,24 with respect to the base 21 so that no translation of the glide members 23,24 with respect to the base 21 is possible when locked in place.

In use, the glide members 23,24 are fitted over the base 21 such that the first and second side members 27,28 are located away from each other to form a holder of a similar configuration to that illustrated in Figures 1 to 4. The two glide members 23,24 are then slid over the base 21 until the spacing between the two side members 27,28 is such as to receive the radio unit 7 between as in the previous embodiments. The screw is rotatably inserted into the hole 29 and the radio unit 7 retained in position as before. Thus, radio units of different dimensions can be accommodated using the same holder.

It will be evident to a person skilled in the art, from the foregoing description, that modifications are possible within the scope of the present invention. For example, four or more securing points can be provided in an analogous manner and suitable securing means other than pegs and holes can be used, or no securing means may be provided. Also, features of one embodiment may be interchangeable with or included in another. For example, the embodiment of Figure 5 may be further provided with the securing means of Figures

1 or 2, and the base of Figure 3 may be configured similar to that of Figure 1.

Claims

1. A holder suited for mounting the radio unit of a mobile telephone, said holder comprising a base member, a first side member protruding essentially orthogonally from the base member and a second side member protruding essentially orthogonally from the base member, said two side members being aligned essentially parallel to and spaced from each other so as to hold the radio unit between them, characterized in that the second side member has at least one tightening means operable to tighten against the radio unit such that the second side member is tensioned by forcing the radio unit against the second side member, thus retaining the radio unit squeezed between the two side members.
2. A holder according to claim 1 wherein the first side member comprises securing means for cooperating with respective securing means provided on the radio unit to secure the radio unit against the first side member.
3. A holder according to claim 2, characterized in that the securing means peg is at least two pegs which are oriented toward the second side member, whereby the radio unit has corresponding recesses for receiving said pegs.
4. A holder according to claim 2, characterized in that the securing is at least two holes whereby the radio unit has at least two corresponding arranged pegs to be inserted in said holes.

5. A holder according to any preceding claim wherein the tightening means is operable to cause the second side member to flex away from the radio unit when the radio unit is forced against the first side member such that the radio unit cannot move further towards the first side member, while the simultaneous stress exerted on the second side member tends to restraighten the second side member such that the frictional force between the screw and the second side members retains the screw in position.

6. A holder according to any of claims 1-5, characterized in that the tightening means is comprised of a screw rotatably inserted in a recess provided in the second side member.

7. A holder according to any preceding claim wherein the spacing between the first and second side member is adjustable.

8. A holder according to claim 7 wherein the first and second side members are provided on respective first and second gliding means mounted on the base and movable with respect thereto so as to provide the adjustable spacing.

9. A holder according to any preceding claim made of sheet metal.

10. A holder as herein before described with reference to Figure 1.

11. A holder as herein before described with reference to Figures 2A and 2B.

12. A holder as herein before described with reference to Figures 3, 4A and 4B.

13. A holder as herein before described with reference to Figure 5.

Examiner's report to the Comptroller under
Section 17 (The Search Report)

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Relevant Technical fields

(i) UK CI (Edition) K E2A (AGKF); A4J (JL);
H3Q (QACX)
5 B60R 11/00 11/02;
(ii) Int CI (Edition) F16B 2/02

Search Examiner

J D WILSON

Databases (see over)

(i) UK Patent Office
(ii) ONLINE DATABASES: EDOC; WPI

Date of Search

5 OCTOBER 1992

Documents considered relevant following a search in respect of claims

ALL

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
Y	GB 1281694 (FORDS OF BRISTOL) see Figure 1	1 at least
X, Y	US 4957264 (HAKANEN) see the figures	1 at least
X, Y	US 4627589 (HOTSUMI) see the figures	2, 3 at least
X, Y	US 4097012 (McINTYRE) see the figures	1 at least
X, Y	US 4028913 (FALK) see the figures	1 at least

Category	Identity of document and relevant passages	Relevance to claim(s)

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